

WHAT IS CLAIMED IS:

1. A WCDMA transceiver, comprising:

2 a transmit chain having a lookup table that provides
3 coefficients to a digital predistorter based on power indicators;
4 and

5 a predistorter training circuit, coupled to said transmit
6 chain, that employs a receive chain of said WCDMA transceiver to
7 provide a digital compensation signal that is a function of an
8 output of said transmit chain and employs both said power
9 indicators and said digital compensation signal to cause said
10 lookup table to provide alternative coefficients to said digital
11 predistorter thereby to reduce distortion in said output.

2. The transceiver as recited in Claim 1 wherein said
transmit chain comprises:

3 an interpolator coupled to an output of said digital
4 predistorter;

5 a digital to analog converter coupled to an output of said
6 interpolator;

7 a low pass filter coupled to an output of said digital to
8 analog converter;

9 a quadrature modulator coupled to an output of said low pass

10 filter; and
11 an amplifier coupled to an output of said quadrature
12 modulator.

3. The transceiver as recited in Claim 1 wherein said
2 receive chain comprises:

3 a quadrature De-modulator;
4 a low pass filter coupled to an output of said quadrature De-
5 modulator; and

6 an analog to digital converter coupled to an output of said
7 low pass filter.

4. The transceiver as recited in Claim 1 wherein said
2 predistorter training circuit comprises a coefficient update
3 circuit to generate alternative power indicators for said lookup
4 table.

5. The transceiver as recited in Claim 1 wherein said power
2 indicators include both real and quadrature components.

6. The transceiver as recited in Claim 1 wherein said
2 predistorter training circuit operates only in a training mode.

7. The transceiver as recited in Claim 1 wherein a root-
2 raised cosine circuit provides said power indicator.

8. A method of reducing distortion in an output of a WCDMA

2 transceiver, comprising:

3 employing a lookup table to provide coefficients to a digital

4 predistorter of a transmit chain based on power indicators;

5 employing a receive chain of said WCDMA transceiver to provide

6 a digital compensation signal that is a function of an output of

7 said transmit chain; and

8 employing both said power indicators and said digital

9 compensation signal to cause said lookup table to provide

10 alternative coefficients to said digital predistorter.

9. The method as recited in Claim 8 wherein said transmit

2 chain comprises:

3 an interpolator coupled to an output of said digital

4 predistorter;

5 a digital to analog converter coupled to an output of said

6 interpolator;

7 a low pass filter coupled to an output of said digital to

8 analog converter;

9 a quadrature modulator coupled to an output of said low pass

10 filter; and

11 an amplifier coupled to an output of said quadrature

12 modulator.

10. The method as recited in Claim 8 wherein said receive
2 chain comprises:

3 a quadrature De-modulator;

4 a low pass filter coupled to an output of said quadrature De-
5 modulator; and

6 an analog to digital converter coupled to an output of said
7 low pass filter.

11. The method as recited in Claim 8 wherein said employing
2 both said power indicators and said digital compensation signal
3 comprises generating alternative power indicators for said lookup
4 table.

12. The method as recited in Claim 8 wherein said power
indicators include both real and quadrature components.

13. The method as recited in Claim 8 wherein said employing
2 both said power indicators and said digital compensation signal is
3 carried out only in a training mode.

14. The method as recited in Claim 8 wherein a root-raised
2 cosine circuit provides said power indicator.

15. A WCDMA transceiver, comprising:

2 a transmit chain, including:

3 a digital predistorter,

4 a lookup table that provides coefficients to said digital
5 predistorter based on power indicators,

6 an interpolator coupled to an output of said digital
7 predistorter,

8 a digital to analog converter coupled to an output of
9 said interpolator,

10 a low pass filter coupled to an output of said digital to
11 analog converter,

12 a quadrature modulator coupled to an output of said low
13 pass filter, and

14 an amplifier coupled to an output of said quadrature
15 modulator;

16 a receive chain, including:

17 a quadrature De-modulator,

18 a low pass filter coupled to an output of said quadrature
19 De-modulator,

20 an analog to digital converter coupled to an output of
21 said low pass filter; and

22 a predistorter training circuit, coupled to said transmit
23 chain, that employs said receive chain to provide a digital

24 compensation signal that is a function of an output of said
25 transmit chain and employs both said power indicators and said
26 digital compensation signal to cause said lookup table to provide
27 alternative coefficients to said digital predistorter thereby to
28 reduce distortion in said output.

16. The transceiver as recited in Claim 15 wherein said
2 predistorter training circuit comprises a coefficient update
3 circuit to generate alternative power indicators for said lookup
4 table.

17. The transceiver as recited in Claim 15 wherein said power
2 indicators include both real and quadrature components.

18. The transceiver as recited in Claim 15 wherein said
2 predistorter training circuit operates only in a training mode.

19. The transceiver as recited in Claim 15 wherein a root-
2 raised cosine circuit provides said power indicator.

20. The transceiver as recited in Claim 15 wherein said
2 transceiver is located within a cellular telephone.